# PATENT ABSTRACTS OF JAPAN

| (51)Int.Cl. | G06F 12/14 |
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(54) CACHE DEVICETRANSMITTING DEVICE AND PROGRAM RECORDING MEDIUM

(57)Abstract:

PROBLEM TO BE SOLVED: To protect and use the copyright as desired by a writer by transmitting selectively the data which are reproduced by a cache device connected to plural devices of opposite parties to one of these opposite parties in accordance with the contents of the copyright.
SOLUTION: The data with which the copyright is claimed are reproduced only once by a cache device 52 and then sent to a digital bus 54. At the same timethe device 52 or a transmitting device 49 selects its device to be used in accordance with the contents of the copyright. In this selection stepif the cache devices other than the device 52 are connected to the bus 54only a cache device 53 can use the data in accordance with the contents of the copyright and other cache devices and the non-cache devices 50 and 51etc.cannot use the data. Otherwisethe devices 5051etc.can all use the data in accordance with the contents of the copyright and the device 53etc.cannot use the data respectively.

CLAIMS

[Claim(s)]
[Claim 1]A recording device which records dataand when the copyright opinion of said data is carried outIt has a reproduction means which reproduces said data

only once without changing the contents of the copyright opinion of said data recorded by said recording deviceA cache device provided with a transmitting selecting means which chooses whether it enables it to use for a device of which partner point data which said reproduction means reproduced among said partner point devices which are cache devices connected to two or more partner point devicesand were connected according to the contents of copyright.

[Claim 2]When one or more devices which have a function of said cache device among devices of said partner point when sending data by which the copyright opinion was carried out existsaid transmitting selecting meansA device which has a function of one device which has a function of said cache deviceor said cache device is removedWhen one set does not existeithera device which enables it to use said data for all devices that do not have a function of said cache device according to the contents of copyrightand has a function of said cache devicethe cache device according to claim 1 characterized by said partner point device's boiling all and enabling it to use said data according to the contents of copyright.

[Claim 3]The cache device according to claim 1 or 2wherein said transmitting selecting means chooses a device of said partner point by passing a key for decrypting enciphered data by which the copyright opinion was carried out to a device of said partner point.

[Claim 4]The cache device according to claim 1 or 2 characterized by choosing a device of said partner point by whether said transmitting selecting means enciphers data by which distributes a key for decrypting data beforehand to a device of said partner point connectedand the copyright opinion was carried out with which key.

[Claim 5]The cache device according to claim 3 or 4 only when attestation is performed with a device of said partner point and it succeeds in attestationbefore said transmitting selecting means passed said key to a device of said partner pointwherein it passes said key.

[Claim 6]The cache device according to claim 5 with which a device of said partner point with which said transmitting selecting means does not have a function of said cache device is characterized by ordering advancing an authentication demand for discovering said cache device when one set has not receivedeitherand receiving said key to said cache device.

[Claim 7]The cache device according to claim 5 when said transmitting selecting means passes said key to a device of said partner pointwherein it enciphers said key with a temporary key used on the occasion of attestation with a device of said partner point and passes it to a device of said partner point.

[Claim 8]The cache device according to any one of claims 1 to 7 when said transmitting selecting means is not carried out [ the copyright opinion of said data ] (copy free)wherein it does not encipher said data.

[Claim 9]Duplication prohibition which it permits viewing and listening only once with the contents of said copyright (copy never)The cache device according to any one of claims 1 to 8wherein a duplicate beyond this which permits reproducing only once (copyone generation) is either which is not permitted (no more copy).

[Claim 10]The cache device according to any one of claims 1 to 9wherein one of said connected partner point devices is the monitor by which direct continuation is carried out to this cache device.

[Claim 11]It is the sending set which was provided with an output means which outputs data and was connected to two or more partner point devicesData which said output means outputted among said connected partner point devicesA sending set by which having a transmitting selecting means which chooses whether it enables it to use for a device of which partner point according to the contents of copyrightand including the one or more cache devices according to any one of claims 1 to 10 in said partner point deviceor one set not being includedeither.

[Claim 12]When one or more devices which have a function of said cache device among devices of said partner point when sending data by which the copyright opinion was carried out existsaid transmitting selecting meansA device which has a function of one device which has a function of said cache deviceor said cache device is removedWhen one set does not existeithera device which enables it to use said data for all devices that do not have a function of said cache device according to the contents of copyrightand has a function of said cache devicethe sending set according to claim 11 characterized by said partner point device's boiling all and enabling it to use said data according to the contents of copyright.

[Claim 13]A sending set which is provided with the followingand is characterized by repealing an analog output of said analog output means when said digital output means carries out the digital output of the data by which the copyright opinion was carried out.
An analog output means which carries out the analog output of the data.
A digital output means which carries out the digital output of said data.

[Claim 14]The sending set according to claim 13 characterized by repealing an analog output of said analog output means when carrying out the digital output of the data characterized by comprising the following in which the copyright opinion of said digital output means was carried out to a recording and reproducing device.
A recording device which records data.
A reproduction means which reproduces said data only once without changing the contents of said copyright when the copyright opinion of said data is carried out.

[Claim 15]The sending set according to claim 11 or 12wherein one of said connected partner point devices is the monitor by which direct continuation is carried out to this sending set.

[Claim 16]Duplication prohibition which it permits viewing and listening only once with the contents of said copyright (copy never)The sending set according to any one of claims 11 to 15wherein a duplicate beyond this which permits reproducing only once (copyone generation) is either which is not permitted (no more copy).

[Claim 17]A program recording medium storing a program for making a computer perform a function of a part or all of each component of the cache device

according to any one of claims 1 to 16 or a sending set.

## DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the cache devicesending setand program recording medium treating the data by which the copyright opinion was carried outwhen two or more apparatus is connected.
[0002]
[Description of the Prior Art]The needs of digitization and multimedia-izing are growing in the systemand a domestic office and business system. It is in such a situation and IEEE1394-1995 is observed in recent years (an IEEE1394 bus is called below). This is the fast serial bus standard standardized in IEEE in 1995. The IEEE1394 bus is provided with the characteristic function for plug and play or multimedia data transfer. That isthe zone for transmitting video and data called a sound is securedand it has the isochronous data transfer (Isochronous) which makes real time transfer possible. Picture image datasuch as a digital camerais also simultaneously controllable by IEEE1394 control commands (asynchronous (asynchronous) data) from the control program of PC connected with the IEEE1394 bus (the change of picture image datacontrol of a camera).
[0003]When exchanging the data of video voice data etc. based on the IEEE1394 bus which is such a standarddata may have copyright. The contents of the copyright of data are expressed with EMI (EncryptionMode Indicator) generated from CGMS (Copy generation management system) and CGMS.
[0004]CGMS exists in the inside of the transport stream sent from a broadcasting station. CGMS is 2-bit data. The value which CGMS can takeand its meaning are as follows.
[0005]Namelycopy never is meant at the time of CGMS=11copy one generation is meant at the time of CGMS=10and copy free is meant at the time of CGMS=00. Howevercopynever is duplication prohibition and it permits viewing and listening to the data only once. copy one genaration can permit one generation of duplicatesand it can view and listen to the reproduced data repeatedly any number of times. It is shown that copyfree may be reproduced freely.
[0006]When CGMS is 11 (i.e.when it is copy never)it can view and listen to data only once. That isonly within the time zone when the data is broadcastit can view and listen to the data.
[0007]EMI is generated by CGMS to STB (Set Top Box: satellite reception machine). That isCGMS is added to data at a broadcasting stationand STB which received the broadcast wave sent from a broadcasting station passes the program received to the IEEE1394 bus. At this timeCGMS is embedded into the portion of the servicing information of the MPEG2 transport stream of isochronous packet data. Two or more MPEG data is stored in one isochronous packet dataand CGMS

correspondingrespectively exists to each MPEG data.

[0008]EMI is generated by CGMS to such STB. STB investigates CGMS of each data transmitted with one isochronous packet dataand gives one EMI to one isochronous packet data as the central value. The EMI is held at the header part of isochronous packet data.

[0009]The value of EMI takes the value of CGMS with the severest restriction of copyright among CGMS(s) of the data which exists in one isochronous packet data. For examplethe value of EMI will be set to 11 with the severest restriction supposing CGMS(s) of the data in one isochronous packet data are 1110and 10. When CGMS(s) are 101000and 00the value of EMI is set to 10 with the severest restriction in it. Thusthe value of EMI is determined.

[0010]EMI=11 expresses duplication prohibition (copy never)EMI=10 expresses permission (copy one generation) for a duplicate only time costandas for the value which EMI can takeEMI=00 expresses duplicate freedom (copy free). So farit is the same as CGMS. There was EMI=01as a thing of only EMIafter this recorded the data of copy onegenerationEMI was changedand the duplicate beyond this expresses disapproval (no more copy).

[0011]When the contents of the copyright by CGMS were copy neverit could view and listen to applicable data only once conventionallybut the time zone to which it can view and listen was restricted to the time zone when the program is broadcast. Thuswhen it is an author's intention to permit viewing and listening only onceit will be limited till the time zone to which it can view and listen. That iseven if it was a case where a televiewer wanted to view and listen to a program in a time zone with sufficient convenience of himit has viewed and listened to the program only in the time zone when a program is broadcast. When the contents of the copyright by CGMS were copy one generationonce it recorded on a certain recording mediumdata was not able to be moved to other recording media.

[0012]In the case of an equipment configuration which does not have a transport decoder etc.the contents of copyright are judged using EMI. Also when EMI is usedit can say that it is the same as that of CGMS.

[0013]Thenwhen the information showing the copyright of a program is copy nevera televiewer can view and listen to data as an intention of the author of permitting viewing and listening only onceAnd a televiewer enables it to view and listen to the datawithout limiting a time zoneafter broadcasting the dataWhen the contents of the copyright of a program are copy one generationthe recording and reproducing device which can move data to another recording medium from the recording medium recorded once is indicated by Japanese Patent Application No. 10-312596.

[0014]The usual recording and reproducing devicessuch as VCRcannot record datawhen the contents of copyright are copy never. Howeverthe recording and reproducing device currently indicated by Japanese Patent Application No. 10-312596 can record the data whose contents of copyright are copy never. Howeverrestriction is imposed when reproducing the recorded data. That isthe data is restricted at once and it enables it to reproduce.

[0015]In order to realize the function which is restricted at once and reproducedthis recording and reproducing device is performing the following processings. That isreproduction information which is information which shows whether data was reproduced or not is made into data and a pairand is recordedand after data is reproducedthe reproduction information of the portion of the reproduced data is set as ending with reproduction from un-reproducing. Or reproduction information is set as the block unit ending with reproduction from the data which reproduction completed during reproduction of data. And only an unreproduced portion reproduces reproduction informationand when reproduction information is set as ending with reproductionthe data of the portion is performing processing in which it is made not to reproduce.

[0016]Or as an option for realizing the function which is restricted once and reproducedthis recording and reproducing device is performing the following processings. That isafter data is reproducedthe reproduced data is eliminated from a recording medium. Or processing in which the portion of the data it became finishing reproducing is eliminated from a recording medium during reproduction of data is performed.

[0017]Or it encipherswhen recording data on a recording medium further apart from the encryption given at the time of data communications as an optionand this encryption is solved when reproducing. The key to decryption to the code for record changes at random with timemakes this key data and a pairand records it on a recording medium. And it prevents from reproducing data only once by completing reproduction of data and eliminating the key of cod roe from a recording medium. Or processing in which it prevents from reproducing data only once is performed by eliminating the key of the portion of the data which reproduction completed during reproduction of data one by one.

[0018]This recording and reproducing device provides the function which reproduces that data only once by the same processing as copy neveralso when the contents of copyright are copy one generation. HoweverEMI is replaced with no more copy and the usual recording and reproducing device outputs itwhen the contents of copyright are EMI in copy one generationand when it is CGMSCGMS is replaced with copy never and it outputs it. On the other handwithout replacing the contents of copyright withthis recording and reproducing device is restricted at once with copy one generationand is reproduced. It becomes possible by doing in this way to move the data of copy one generation to another recording medium from a certain recording medium.

[0019]

[Problem(s) to be Solved by the Invention]Howevertwo or more various devices are connected to an IEEE1394 busand data of each other is exchanged. When exchanging the data in which the copyright opinion of such a recording and reproducing device was carried out with other devicesSUBJECT that copyright cannot be kept occurs as an author's intention.

[0020]For examplethe case where two or more devices in which the contents of copyright have a function still more equivalent to this recording and reproducing

device after this recording and reproducing device records the data of copy never acquire and record data from this recording and reproducing device simultaneously arises. copyright cannot be kept as an intention of the author that that is rightthen the data of copy never permits it being recorded on two or more devicesand multiple-times viewing and listening of this data being carried outand viewing and listening only once. The case where the device in which the contents of copyright have a function still more equivalent to a monitor and this recording and reproducing device after this recording and reproducing device records the data of copy never acquires data arises. A recording and reproducing device will reproduce this data only once furtherand it can view and listen once againand if it does soafter viewing and listening to this data once by monitorcopyright cannot be kept as an intention of the author of permitting viewing and listening only once. Receive broadcast wavessuch as STBand a sending set with the function which transmits the received data to other apparatus is receivedIf the contents of copyright send the data of copy never from said sending set when said two or more recording and reproducing devices are connectedSaid two or more recording and reproducing devices will recordmultiple-times viewing and listening of this data can be carried outand copyright cannot be kept as an intention of the author of allowing viewing and listening only once.

[0021]An analog terminal is providedan analog monitor is connected to this analog terminaland there are some which can view and listen now to the video voice data sent from a broadcasting station in said sending set. When such a device outputs data and this recording and reproducing device existsSUBJECT that copyright cannot be kept occurs as an author's intention.

[0022]For examplesince it is recorded on this recording and reproducing device connected to the IEEE1394 bus once it is viewed and listened with an analog monitor when this recording and reproducing device outputs the data in which copyright has such a device to the IEEE1394 bus to which it is connectedit can view and listen twice. Thereforean intention of the author of permitting viewing and listening only once is not protected.

[0023]Thusthe device which reproduces only once the conventional data by which the copyright opinion is carried out without changing the contents of copyright includes various SUBJECT which was mentioned above. In an application concernedthe device which solved these SUBJECT will be called a cache device.

[0024]SUBJECT that this invention cannot keep copyright as an author's intention when two or more devices are connected including the device which reproduces only once the data by which the copyright opinion is carried out without changing the contents of copyrightSUBJECT that copyright cannot be kept as an author's intention when the monitor is connected to the terminal for a monitor and this device outputs the data by which the copyright opinion is carried out is taken into considerationCopyright can be kept against the data by which the copyright opinion is carried out as an author's intentionIt can view and listen to data in arbitrary time zones other than the time zone when data was moreover broadcastWhen the terminal for a monitor is furthermore providedthe monitor is

connected and the copyright opinion of the data is carried outit aims at providing the cache devicesending setand program recording medium which can keep copyright as an author's intention.

[0025]

[Means for Solving the Problem]A cache device the 1st this invention is characterized by that comprises the following in order to solve SUBJECT mentioned above.

A recording device by which correspondence) records data on (Claim 1.

It has a reproduction means which reproduces said data only once without changing the contents of the copyright opinion of said data recorded by said recording device when the copyright opinion of said data is carried outA transmitting selecting means which chooses whether it enables it to use for a device of which partner point data which said reproduction means reproduced among said partner point devices which are cache devices connected to two or more partner point devicesand were connected according to the contents of copyright.

[0026]The 2nd this invention (it corresponds to Claim 2) said transmitting selecting meansWhen one or more devices which have a function of said cache device among devices of said partner point when sending data by which the copyright opinion was carried out existA device which has a function of one device which has a function of said cache deviceor said cache device is removedWhen one set does not existeithera device which enables it to use said data for all devices that do not have a function of said cache device according to the contents of copyrightand has a function of said cache deviceit is a cache device given in the 1st invention characterized by said partner point device's boiling all and enabling it to use said data according to the contents of copyright.

[0027]The 3rd this invention (it corresponds to Claim 3) is a cache device given in the 1st or 2nd inventionwherein said transmitting selecting means chooses a device of said partner point by passing a key for decrypting enciphered data by which the copyright opinion was carried out to a device of said partner point.

[0028]The 4th this invention (it corresponds to Claim 4) said transmitting selecting meansA key for decrypting data beforehand is distributed to a device of said partner point connectedand it is a cache device given in the 1st or 2nd invention characterized by choosing a device of said partner point by whether data by which the copyright opinion was carried out with which key is enciphered.

[0029]The 5th this invention (it corresponds to Claim 5) is a cache device given in the 3rd or 4th invention only when attestation is performed with a device of said partner point and it succeeds in attestationbefore said transmitting selecting means passed said key to a device of said partner pointwherein it passes said key.

[0030]The 6th this invention (it corresponds to Claim 6) said transmitting selecting meansA device of said partner point which does not have a function of said cache device is a cache device given in the 5th invention discovering said cache device and ordering advancing an authentication demand for receiving said key to said

cache devicewhen one set has not receivedeither.

[0031]The 7th this invention (it corresponds to Claim 7) is a cache device given in the 5th invention when said transmitting selecting means passes said key to a device of said partner pointwherein it enciphers said key with a temporary key used on the occasion of attestation with a device of said partner point and passes it to a device of said partner point.

[0032]The 8th this invention (it corresponds to Claim 8) is a cache device given in either of the 1-7th inventions when said transmitting selecting means is not carried out [ the copyright opinion of said data ] (copy free)wherein it does not encipher said data.

[0033]The 9th this invention (it corresponds to Claim 9) with the contents of said copyright. Duplication prohibition which it permits viewing and listening only once (copy never)or a duplicate beyond this does not permit or (copy one generation) permit reproducing only once -- it is (no more copy) -- it is a cache device given in either of the 1-8th inventions characterized by things.

[0034]The 10th this invention (it corresponds to Claim 10) is a cache device given in either of the 1-9th inventionswherein one set is a monitor by which direct continuation is carried out to this cache device among said connected partner point devices.

[0035]The 11th this invention (it corresponds to Claim 11)It is the sending set which was provided with an output means which outputs data and was connected to two or more partner point devicesData which said output means outputted among said connected partner point devicesIt is a sending set by which having a transmitting selecting means which chooses whether it enables it to use for a device of which partner point according to the contents of copyrightand including one or more cache devices of a description in either of the 1-10th inventions in said partner point deviceor one set not being includedeither.

[0036]The 12th this invention (it corresponds to Claim 12)When one or more devices which have a function of said cache device among devices of said partner point when sending data by which the copyright opinion was carried out existsaid transmitting selecting meansA device which has a function of one device which has a function of said cache deviceor said cache device is removedWhen one set does not existeithera device which enables it to use said data for all devices that do not have a function of said cache device according to the contents of copyrightand has a function of said cache deviceit is a sending set given in the 11th invention characterized by said partner point device's boiling all and enabling it to use said data according to the contents of copyright.

[0037]The 13th this invention (it corresponds to Claim 13)When it has an analog output means which carries out the analog output of the dataand a digital output means which carries out the digital output of said data and said digital output means carries out the digital output of the data by which the copyright opinion was carried outit is a sending set repealing an analog output of said analog output means.

[0038]The 14th this invention (it corresponds to Claim 14)As opposed to a

recording and reproducing device provided with a recording device which records dataand a reproduction means which reproduces said data only once without changing the contents of said copyright when the copyright opinion of said data is carried outWhen said digital output means carries out the digital output of the data by which the copyright opinion was carried outit is a sending set given in the 14th invention repealing an analog output of said analog output means.

[0039]The 15th this invention (it corresponds to Claim 15) is a sending set given in an invention of the 11th or 12wherein one set is a monitor by which direct continuation is carried out to this sending set among said connected partner point devices.

[0040]The 16th this invention (it corresponds to Claim 16)Duplication prohibition which it permits viewing and listening only once with the contents of said copyright (copy never)A duplicate beyond this which permits reproducing only once (copy one generation) is a sending set given in either of the 11-15th inventions being either which is not permitted (no more copy).

[0041]The 17th this invention (it corresponds to Claim 17) is a program recording medium storing a program for making either of the 1-16th inventions perform a function of a part or all of each component of a cache device of a descriptionor a sending set to a computer.

[0042]

[Embodiment of the Invention]An embodiment of the invention is described with reference to Drawings below.

[0043](A 1st embodiment) The concept of a cache devicea non-cache deviceand a sending set is first explained with reference to drawing 7 and drawing 8. These concepts are used in common by the 2-7th embodiments mentioned later.

[0044]It is IEEE standardfor High performance Serial Bus the digital bus 54 is described to be by IEEE1394-1995 in drawing 8for example (an IEEE1394 bus is called below)It is a bus which can perform an exchange of a command and data between each devicesuch as an IEEE1394 bus. STB55the TV monitor 56the hard disk drive 57etc. are connected to the digital bus 54. STB55 receives the data sent from a broadcasting stationtransmit to the digital bus 54and the data the TV monitor 56Monitoring [ and ] the data sent to the digital bus 54the hard disk drive 57 records the data sent to the digital bus 54and reproduces the data currently recordedand transmits to the digital bus 54. Such various devices will be first classified according to this embodiment as a cache devicea non-cache deviceand a sending set.

[0045]In drawing 7the digital bus 54 is an IEEE1394 busan exchange of a command and data can be performedand each device is connected. The non-cache devices 50 and 51the cache devices 52 and 53the sending set 49etc. are connected to the digital bus 54.

[0046]The non-cache device 50 or 51 performs the usual processing according to the contents of the copyright of datafor example like the television monitor 56 first. That isdata is processed according to the value of EMI which is the contents of the copyright of data. In the case of the television monitor 56data is monitored

even if it is a case where EMI is any of copy nevercopy onegenerationand nomore copy. Data is not recorded when the non-cache device 50 or 51 is a device which performs record reproductionsuch as a hard disk drive and VCRand EMI is copy never and no more copy. When EMI is copy one generationthe data is recordedand at the time of reproductionfrom copy one generationEMI is changed into no more copy and outputted. When the data sent from a broadcasting station is copy neversince the non-cache device 52 or 53 does not record the data even if it is a device which performs record reproductionit can view and listen to the program only on a broadcasting-hours belt. Thusthe non-cache device 50 or 51 is a device which processes data according to the contents of the copyright of dataand can be divided roughly into the device which monitors dataand the device which performs record reproduction depending on the contents of copyright.

[0047]NextEMI can record the data of copy never or no more copythe cache device 52 or 53 reproduces the data only onceand more than two times are the devices which are not reproduced. It can view and listen in the arbitrary time zones when a televiewer wants to view and listen to the dataprotecting an author's intention by doing in this way. Also about the data of copy one generationit is recordableit restricts at once and supposes that it is refreshableand at the time of reproductionEMI leaves EMI copy one generation and outputs it. Until a televiewer records data on the non-cache device 50 or 51protecting an author's intention by doing in this waySince data can be held temporarilya televiewer can record on the non-cache device 52 or 53 at a televiewer's favorite timeafter examining enough the device which records data.

[0048]Although the sending set 49 does not carry out receiving data from the digital bus 54 like STB55 of <u>drawing 8</u>it is a device which obtains data from other placessuch as a broadcasting stationand transmits data to the digital bus 54.

[0049]Although the above explanation explained based on EMI as contents of copyrightwhen a cache device and a non-cache device have a transport stream decoderdata is processed by CGMS according to the contents of copyright. Since it is not the data by which the copyright opinion was carried out in EMI and CGMS in copy freethere is no restriction at the time of processing the data.

[0050]The concept of a cache devicea non-cache deviceand a sending set becomes such.

[0051]If it is under the situation where the cache device 50 or 51 is connected to the digital bus 54 so that clearly from the place explained by Object of the Inventionthe contents of the copyright of the data by which the copyright opinion was carried out cannot be kept. Soby this embodimenteven if it is in the situation where the cache device 50 or 51 is connected to belowit explains that the contents of the copyright of data can be kept.

[0052]The case where the (1) cache device 52 transmits first the data by which the copyright opinion was carried out to the digital bus 54 is explainedNextthe case where the (2) sending set 49 transmits the data by which the copyright opinion was carried out to the digital bus 54 is explainedand the case where the (3) non-cache device 50 transmits the data by which the copyright opinion was

carried out to the digital bus 54 is explained to the last.

[0053](1) The explanation cache device's 52 in case the cache device's 52 transmits the data's by which the copyright opinion's was carried out to the digital bus 54 reproduction of the data by which the copyright opinion was carried out only once will transmit the data to the digital bus 54. The contents of copyright cannot be kept if the non-cache device 50 or 51 uses this data simultaneously simultaneously with other cache devices 53. Thenthe following rules are established so that the contents of copyright can be kept.

[0054]That isthe data by which the copyright opinion was carried out is received from the digital bus 54and the cache device 52 sorts out the device used according to the contents of copyright.

[0055]When cache devices other than cache device 52 are connected to the digital bus 54the method of sortingOnly one of cache devices enables it to use data according to the contents of copyrightand the other cache device and a non-cache device are prevented from using data. Or it enables it to use data for all non-cache devices according to the contents of copyrightand prevents from using data for a cache device.

[0056]When any cache devices other than cache device 52 are not connected to the digital bus 54it enables it to use data for all the devices linked to the digital bus 54 according to the contents of copyright.

[0057]While the cache device 52 is reproducedwhen record is also possible apparatus simultaneouslyWhen one cache device other than cache device 52 uses and records the data which cache device 52 itself outputs and by which the copyright opinion was carried outthe cache device 52 is prevented from recording the data which oneself outputs. That isthe cache device which permits record is made only into one set including cache device 52 itself which has sent out data.

[0058]The cache device which can use data now records the dataand reproduces it only once. Supposing this cache device is the cache device 53the operation at the time of the cache device 53 reproducing data only once again is the same as that of the case where the cache device 52 reproduces data.

(2) The explanation sending set 49 in case the sending set 49 transmits the data by which the copyright opinion was carried out to the digital bus 54 transmits the data by which the copyright opinion was carried out to the digital bus 54. The contents of copyright cannot be kept if the cache devices 52 and 53 and the non-cache devices 50 and 51 use this data simultaneously. Thenthe following rule is established so that the contents of copyright can be kept.

[0059]That isthe data by which the copyright opinion was carried out is received from the digital bus 54and the sending set 52 sorts out the device used according to the contents of copyright.

[0060]When one or more cache devicesuch as the cache device 52 or 53are connected to the digital bus 54the method of sortingOnly one of cache devices enables it to use data according to the contents of copyrightand the other cache device and a non-cache device are prevented from using data. Or it enables it to use data for all non-cache devices according to the contents of copyrightand a

cache device is prevented from using data.

[0061]When cache devicessuch as the cache devices 52 and 53are not connected to the digital bus 54it enables it to use data for all the devices linked to the digital bus 54 according to the contents of copyright.

[0062]While the sending set 49 transmitsthe stream from an IEEE1394 bus is received simultaneouslyWhen the monitor output of said stream which received is also possible apparatus and one cache device other than sending set 49 uses and records the data which sending set 49 itself outputs and by which the copyright opinion was carried outthe sending set 49 is prevented from receiving the data which oneself outputs. That iswhen a sending set has a function of a non-cache deviceit considers that the portion of the function is one cache deviceand it is processed.

[0063]While the sending set 49 transmits to the digital bus 54when there is a function which carries out the monitor output of the data simultaneously and one cache device uses and records the data which the sending set 49 outputs and by which the copyright opinion was carried outsaid monitor output is repealed.

[0064]The cache device which can use data now records the dataand reproduces it only once. Supposing this cache device is the cache device 52the operation at the time of the cache device 52 reproducing data only once again will carry out the same operation as "(1) Explanation in case the cache device 52 transmits the data by which the copyright opinion was carried out to the digital bus 54."

[0065](3) The explanation non-cache device 50 in case the non-cache device 50 transmits the data by which the copyright opinion was carried out to the digital bus 54 transmits the data by which the copyright opinion was carried out to the digital bus 54. The contents of copyright cannot be kept if the cache devices 52 and 53 and the non-cache devices 50 and 51 use this data simultaneously. Thenthe following rule is established so that the contents of copyright can be kept.

[0066]That isthe data by which the copyright opinion was carried out is received from the digital bus 54and the structure which can sort out the device which can be used according to the contents of copyright is created beforehand. There are two kinds of methods in this.

[0067]The 1st method first supports the key of attestation with another cache devices 52 and 53 and non-cache devices 50 and 51or another kind. That isin order to receive data from the non-cache device 50when the device which attests by advancing an authentication demand is the non-cache device 51the method of attestation is beforehand decided that attestation is successful. In order to receive data from the non-cache device 50when the device which attests by advancing an authentication demand is the cache device 52 or 53the method of attestation is beforehand decided that attestation goes wrong. Howeversince it is necessary to carry out attestation in the transmission to a non-cache device from a cache device as explained in "(1) Case where a cache device outputs the data by which the copyright opinion was carried out to the digital bus 54"the method of attestation is decided that the attestation in this case is successful. Thuswhen the authentication method was determined and the data by which the copyright

opinion was carried out from the non-cache device 50 is transmitted to the digital bus 54since it is limited to the non-cache device 50 or 51that this data can be used according to the contents of copyright can keep the contents of copyright. If the non-cache device which received data is a device in which record reproduction is possibleit will carry out the same operation as the non-cache device 50 from the beginning [ which is this explanation / "in case the (3) non-cache device 50 transmits the data by which the copyright opinion was carried out to the digital bus 54" ].

[0068]The 2nd method switches the mode so that the same operation as a non-cache device may be carried outwhen the cache device 52 or 53 is sent [ the data by which the copyright opinion was carried out from the non-cache device 50 ]. The cache device is kept from becoming the mode in which it operates as a cache deviceas the method of a mode changeunless it is attested that it is a cache device. For examplewhen the data whose EMI is copy never has been sent from the non-cache device 50since the function which attests the cache device 52 or 53 as a cache device is not supportedthe non-cache device 50 is identified as a non-cache device. Thenthe cache device 52 or 53 will operate in the mode as a non-cache device. Thereforethe cache device 52 or 53 does not record the data. Copyright can be kept also when data will be sent from the non-cache device 50if it does in this way. Howeverit is referred to as no more copy when transmitting the data of copy one generation recorded in non-cash mode in cash mode in the case of such a cache device. Becausewhen the data of copyone generation recorded in non-cash mode is transmitted in cash mode with copy one generationFor examplethe point of one non-cache device has a cache device of n standWhen the cache device of m stand is respectively connected with said cache deviceAfter the cache device of n stand records the data of n copy one generation which operated in non-cash modeIt is because the data of copy one generation of a nxm individual will exist and the one number after another of duplicates will be able to be increasedif the cache device of a nxm individual serves as cash mode in cash mode with copy onegeneration. Since the cache device which received data operates as a non-cache deviceit carries out the same operation as explanation of the non-cache device 50 "in case the (3) non-cache device 50 transmits the data by which the copyright opinion was carried out to the digital bus 54."

[0069]This embodiment explained the concept of the cache devicethe non-cache deviceand the sending set. Also when the cache device was connected to the digital busit was shown that the copyright of the data by which the copyright opinion was carried out can be kept.

[0070](A 2nd embodiment) A 2nd embodiment is described with reference to drawing 1 below.

[0071]a 1st embodiment −− explanation −− likea cache device enables it to use data for which device according to the contents of copyright among the devices which receive dataor chooses a device. This embodiment explains the example at the time of the device which outputs data choosing the device using data.

[0072]Drawing 1 is a block diagram of the transmitting selecting means 1 which chooses the device which is built into a cache device and a sending set and uses data. The transmitting selecting means 1 is constituted as follows.

[0073]That isthe mode storage means 2 is a means to memorize as the mode distinction which can use making (it is called non-cash mode below) for a non-cache device that data can be used [ making (it is called cash mode below) or ] for a cache device according to the contents of copyright. The receiving device candidate determination means 3 is a means to determine the candidate of the device which had a Request to Send and an authentication demand in order to use dataand the device which discover a suitable cache device when there is no non-cache device in a receive stateand uses data. The receiving device discriminating means 4 is a means to distinguish by attesting whether the device which is going to use data is a cache device and a non-cache device. The mode determination means 5 is a means by which the classification using data of a device determines the mode whether to set it in cash mode or non-cash mode. A reporting means is a means to notify that mode which is the present cash mode or non-cash mode to the non-cache device 11 and the cache device 12. The key generation & output means 7 in the case of cash modeIt is a means to generate a key for one of cache devices to decrypt the data enciphered for transmissionand to pass a key to the one specific setand to generate the key for decrypting the data enciphered by all non-cache devices for transmission in the case of non-cash modeand to pass a key. The encoding means 8 is a means to encipher the data by which the copyright opinion is carried out with the key generated by the key generation & output means 7and to output to the digital bus 54. The authentication means 9 is a means which attests when passing the key for decrypting the data enciphered by the encoding means 8 to a cache device or a non-cache device. The changeover switch 10 is a switch which changes which device and attestation are performed among a non-cache device or a cache device.

[0074]As a device using the data from the transmitting selecting means 1the non-cache device 11 and the cache device 12 have connected with the digital bus 54.

[0075]Nextoperation of such this embodiment is explained.

[0076]Before the transmitting selecting means 1 transmits first the data by which the copyright opinion was carried out to the digital bus 54as for the receiving device candidate determination means 3the candidate of a receiving set is determined. If a Request to Send and an authentication demand occur from the non-cache device 11the cache device 12etc.let the device which advanced the Request to Send and the authentication demand be a candidate of a receiving set. When a non-cache device advances neither a Request to Send nor an authentication demand also for one setthe receiving device candidate determination means 3 discovers a cache device from the device connected to the digital bus 54and sends the command which the cache device is ordered to emit an authentication demand. When one set is not connectedeithera cache device may choose any one of non-cache devicesand may send the command which it is ordered to emit an authentication demand to the non-cache device. Thusthe

receiving device candidate determination means 3 determines the candidate of a receiving device. What is necessary is just to publish the command which asks whether to be a cache devicefor examplein order to discover a cache device.

[0077]Nextthe receiving device discriminating means 4 judges the kind of receiving set out of the candidate determined by the receiving device candidate determination means 3. The method of the judgment attests whether the candidate of a receiving set is a cache device. It is distinguished that the receiving set is a cache device if the receiving set which is a candidate succeeds in attestation with the receiving device discriminating means 4. If attestation goes wrongit will be distinguished that the receiving set is a non-cache device.

[0078]Nextthe mode determination means 5 determines cash mode or non-cash mode based on the kind of candidate of the receiving set judged by the receiving device discriminating means 4. If the mode is furthermore determinedthe determined mode will be memorized to the mode storage means 2. For exampleif it is decided by the mode determination means 5 that it will be cash modethe mode storage means 2 will memorize cash mode as the present mode. Furthermorethe reporting means 6 notifies the candidate of the receiving set determined by the receiving device candidate determination means 3 in the mode determined by the mode determination means 5 of the present mode. For examplewhen it is decided that it will be cash modeall the candidates of a receiving set are notified of the mode being cash mode. It is enciphered by the encoding means 8 and the data by which the copyright opinion was carried out is outputted to the digital bus 54. Furthermoreit is determined whether the mode determination means 5 sends the key which decrypts this enciphered data to the candidate of which receiving set.

[0079]What is necessary is just to determine the decision criterion of of which receiving set the mode determination means 5 determines a candidate as a actual receiving set in accordance with one which is described below of decision criteria.

[0080]That isit is judging the receiving set which advanced the Request to Send of data to the very first at the transmitting selecting means 1 to be a actual receiving set as the 1st decision criterion. As the 2nd decision criterionthe televiewer does prioritization of the receiving set beforehand and it is judging it as a actual receiving set from the high thing of this priority. It is judging the receiving set which advanced the Request to Send of data to the very end at the transmitting selecting means 1 to be a actual receiving set as the 3rd decision criterion. It is giving priority to the cache device over a non-cache device among the candidates of a receiving setand judging it as a actual receiving set as the 4th decision criterion. It is giving priority to a non-cache device over the inner cache device of the candidate of a receiving setand judging it as a actual receiving set as the 5th decision criterion. It is judging a actual receiving set as the 6th decision criterion based on the capability of devicessuch as the record time and the number of simultaneous record channels. For examplethe record time is judging what has many numbers of channels recordable it is long and simultaneous to be a actual receiving set. It is judging a actual receiving set as the 7th decision criterion based on the frequency in use of a device. For exampleit is judging the

receiving set used most frequently to be a actual receiving set. Or it is judging the receiving set which is not used most to be a actual receiving set. The decision criterion of of which receiving set the mode determination means 5 determines a candidate as a actual receiving set above was described.

[0081]Nextthe authentication means 9 is attested with the candidate of a receiving set who should hand a keyin order to pass this key. For examplewhen passing a key to the non-cache device 11 is determinedif it attests with the non-cache device 11 and attestation is successfulthe key for decrypting the data in which the key generation & output means 7 was enciphered will be generatedand it will send to all the non-cache devicessuch as the non-cache device 11. When the candidate who hands a key is a cache deviceit sends only to any one cache device among the candidates of a cache device. Howeverit enciphers beforehand with a temporary key used when performing attestation with a receiving set by the authentication means 9and this key is passed to one cache devicesuch as the cache device 12it is this temporary key in the cache device 12 sideand the key for decryption of data is decrypted and used for it.

[0082]If the key for decryption of a cache device of data comes to handthe data and the key which are sent from the digital bus 54 will be recorded.

[0083]According to this embodimentthe device which can use the data by which the copyright opinion was carried out is determined by passing the key for decrypting the enciphered data to the device which the transmitting selecting means 1 chose. About whether which device is chosenit is the same as that of a 1st embodiment having explained.

[0084](A 3rd embodiment) A 3rd embodiment is described with reference to drawing 2 below.

[0085]a 1st embodiment — explanation — likea cache device enables it to use data for which device according to the contents of copyright among the devices which receive dataor chooses a device. This embodiment also explains the example at the time of the device which outputs data choosing the device using data.

[0086]Drawing 2 is a block diagram of the transmitting selecting means 1 which chooses the device which is built into a cache device and a sending set and uses data. The transmitting selecting means 1 is constituted as follows.

[0087]That isthe receiving device candidate determination means 3 is a means to determine the candidate of the device which had a Request to Send and an authentication demand in order to use dataand the device which discover a suitable cache device when there is no non-cache device in a receive stateand uses data. What is necessary is just to publish the command which asks whether to be a cache devicefor examplein order to discover a cache device. The receiving device group-ized means 13 is a means which carries out grouping by attesting with each candidate of a receiving set. The key generating means 14 is a means to generate the key which decrypts the data enciphered for [ each ] the groups of the receiving set by which grouping was carried out by the receiving device group-ized means 13. A different key is generated by different group. The Request-to-

Send detection means 18 is a means to detect any Request to Send from which group there is. The transmission groups determination means 17 is a means to determine whether to encipher the key by which the copyright opinion was carried out with which group's key from a group with the Request to Send detected by the Request-to-Send detection means 18and the present transmission groups. The present transmission groups memory measure 16 is a means to remember the determined group. The Key distribution means 15 is a means to distribute the key generated by the key generating means 14 to each group's device. The authentication means 9 is a means to encipher and distribute the key which decrypts data with a temporary key which performed the device and attestation which have advanced the demand which receives a key when distributing the key generated by the key generating means 14and was then generated. The changeover switch 10 changes which device and attestation are performed.

[0088]Nextoperation of such this embodiment is explained.

[0089]Before the transmitting selecting means 1 transmits first the data by which the copyright opinion was carried out to the digital bus 54as for the receiving device candidate determination means 3the candidate of a receiving set is determined. If a Request to Send and an authentication demand occur from a non-cache devicea cache deviceetc.let the device which advanced the Request to Send and the authentication demand be a candidate of a receiving set. When a non-cache device advances neither a Request to Send nor an authentication demand also for one setthe receiving device candidate determination means 3 discovers a cache device from the device connected to the digital bus 54and sends the command which the cache device is ordered to emit an authentication demand. When one set is not connectedeithera cache device may choose any one of non-cache devicesand may send the command which it orders it to emit an authentication demand to the non-cache device. Thusthe receiving device candidate determination means 3 determines the candidate of a receiving device.

[0090]Nextthe receiving device group-ized means 13 judges and carries out grouping of the kind of receiving set out of the candidate determined by the receiving device candidate determination means 3. The method of the grouping attests whether the candidate of a receiving set is a cache device. It is distinguished that the receiving set is a cache device if the receiving set which is a candidate succeeds in attestation with the receiving device group-ized means 13. If attestation goes wrongit will be distinguished that the receiving set is a non-cache device. Furthermore about a cache deviceit divides into another group for every one device. A non-cache device is all packed and is made into one group. It is divided into three kinds of groupsABand Cin the present receiving device group-ized means 13. All the non-cash group's devices are registered into A. One device of a cash group is registered into B. One another device of a cash group is registered also into C.

[0091]Nextthe key generating means 14 generates the key for decrypting data in each group by whom grouping was done by the receiving device group-ized means 13. This key is a different key for every group. That isthe data enciphered with the

group's A key cannot be decrypted with the group's B key.

[0092]When the authentication means 9 performs the device and attestation belonging to each group and succeeds in attestationit is a temporary key used in the case of attestationenciphers the key decided for every groupand distributes the Key distribution means 15 to the group's device. Thusselection of the device which receives data is attained by carrying out grouping of the device which serves as a candidate of a receiving devicebefore outputting data to a digital busand distributing a different key for every group.

[0093]The Request-to-Send means 18 detects whether there is any Request to Send from which groupand determines whether based on thiswith which group's keythe transmission groups determination means 17 enciphers dataand transmits. The encoding means 8 enciphers data using a group's determined keyand outputs it to the digital bus 54. Since keys differ for every group as mentioned aboveonly the determined group can decrypt data.

[0094]Thusselection of a device which was explained by a 2nd embodiment is attained.

[0095]Finally the decision criterion of whether with which group's keythe transmission groups determination means 17 enciphers dataand transmits is described below.

[0096]That isit is judging the receiving set which advanced the Request to Send of data to the very first at the transmitting selecting means 1 to be a actual receiving set as the 1st decision criterion. As the 2nd decision criterionthe televiewer does prioritization of the receiving set beforehand and it is judging it as a actual receiving set from the high thing of this priority. It is judging the receiving set which advanced the Request to Send of data to the very end at the transmitting selecting means 1 to be a actual receiving set as the 3rd decision criterion. It is giving priority to the cache device over a non-cache device among the candidates of a receiving setand judging it as a actual receiving set as the 4th decision criterion. It is giving priority to a non-cache device over the inner cache device of the candidate of a receiving setand judging it as a actual receiving set as the 5th decision criterion. It is judging a actual receiving set as the 6th decision criterion based on the capability of devicessuch as the record time and the number of simultaneous record channels. For examplethe record time is judging what has many numbers of channels recordable it is long and simultaneous to be a actual receiving set. It is judging a actual receiving set as the 7th decision criterion based on the frequency in use of a device. For exampleit is judging the receiving set used most frequently to be a actual receiving set. Or it is judging the receiving set which is not used most to be a actual receiving set.

[0097]The decision criterion of whether abovewith which group's keythe transmission groups determination means 17 enciphers dataand transmits was described.

[0098]Although chosen in this embodiment by passing the key for decrypting data for the device of the partner point using datait can also be reported beforehand whether data can be used for the device of the partner point which serves as a

candidate using data. Since it is not necessary to carry out processing which decrypts the data sent since the device of the partner point understands whether data can be used or not if it does in this waystarting-each device load is mitigable.

[0099](A 4th embodiment) A 4th embodiment is described with reference to Drawings below.

[0100]This embodiment explains STB as an example which included the transmitting selecting means 1 explained by a 2nd or 3rd embodiment in the actual device. This STB functions as a sending set.

[0101]In drawing 3the antenna 19 is a means to receive the broadcast wave broadcast from a broadcasting station. The tuner part 20 is a means to choose the program by a broadcast wave and to output a transport stream. The transport stream decoder part 21 is a means to decode a transport stream and to detect CGMS. The EMI grant means 22 is a means to generate and give EMI from detected CGMS. The digital I/F means 23 are the digital bus 54 and a means to perform the exchange of data or a command. The transmitting selecting means 1 is the same as that of one of the things which chooses to any the data by which the copyright opinion was carried out shall be sent between a cache device or a non-cache deviceand explained it by a 2nd or 3rd embodiment.

[0102]Nextoperation of such this embodiment is explained.

[0103]From the broadcasting stationCGMS is embedded at the transmitted broadcast wave. The tuner part 20 which received this broadcast wave chooses a program. The selected program is passed to the transmitting selecting means 1 as a bit stream. The transport stream decoder part 21 is also passed simultaneouslyand it is decoded. When decodedCGMS is detectedand EMI is generated by the EMI grant means 22 from CGMS. In the transmitting selecting means 1the same processing as a 2nd or 3rd embodiment having explained is performedandin the case of the data by which the copyright opinion was carried outit is chosen of which transmission destination a device can use data according to the contents of copyright. The data by which the copyright opinion is furthermore carried out is encipheredand it outputs to the digital I/F means 23. Under the present circumstancesEMI generated by the EMI grant means 22 is given.

[0104]Thusby sending data to a cache devicekeeping the contents of copyright as a sending set by including the transmitting selecting means 1 in STBIt can view and listen to a program in arbitrary time zones other than a broadcasting-hours beltand when EMI is copy neverin copy one generationdata can be moved at arbitrary time.

[0105](A 5th embodiment) Drawing 4 is used and explained about a 5th embodiment below.

[0106]This embodiment explains the example of TV monitor as an example of a non-cache device.

[0107]The digital I/F means 27 is a means to receive data from the digital bus 54 and to exchange a command. The EMI detection means 28 is a means to detect EMI from the data sent from the digital I/F means 27. When attestation and the

decoding means 29 receive the data by which the copyright opinion was carried outperforms the device and attestation which transmit data and succeeds in attestationit is a means to receive the key for decrypting the data enciphered and to decrypt data. The transport stream decoder part 21 is a means to decode the decrypted data (transport stream)and is a means to separate the multiplexed data. The AV stream decoder section 24 is a means to output while elongating the MPEG data compressed and taking AV synchronization. It is a means to separate the multiplexed data. The D/A conversion part 25 is a means to change elongated AV digital data into an analog signal. The display 30 is a means to display an analog signal on a display.

[0108]Nextoperation of such this embodiment is explained.

[0109]An authentication demand for attestation and the decoding means 29 to receive data is published firstand attestation is performed with the device by the side of delivery of data. The key for decrypting data is enciphered and passed with the key which had temporarily and was on the occasion of attestation when attestation was successful. The EMI detection means 28 detects EMI simultaneously with it. According to the value of EMIit is judged whether attestation and the decoding means 29 decrypt data using the key which decrypts data. If attestation and the decoding means 29 decrypt datathe data will be passed to the transport stream decoder part 21and the multiplexed data will be separated. FurthermoreMPEG data is elongated by the AV stream decoder section 24. The D/A conversion part 25 changes digital data into an analog signaland the display monitor 30 monitors an analog signal.

[0110]Such a TV monitor of the usual composition can function as a non-cache device also under the situation where a cache device and a non-cache device exist.

[0111](A 6th embodiment) A 6th embodiment is described with reference to drawing 5 and drawing 6 below.

[0112]This embodiment explains the hard disk drive which functions as a cache device.

[0113]Drawing 5 is a basic constitution figure of the hard disk drive of this embodiment.

[0114]A hard disk drive comprises the digital I/F means 31the stream control means 32the LBA accessing means 33the hard disk control means 34the actuator means 35the disc medium 36the head 37and the spindle motor means 38.

[0115]The digital I/F means 31 is an IEEE1394 busand are the digital bus 54 and a means to perform the exchange of data or a command. Transmission processing can be performed transmission of the AV information of the digital I/F means 31 being performed by the transmission mode called an isochronous (Isochronous) methodand guaranteeing the real time nature of the data transmitted. There are an MPEG transport streama DV streametc. as data transmitted. Control of the AV equipment of the digital I/F means 31 is performed by the asynchronous transmission mode called an asynchronous (Asyncronous) method. The stream control means 32 is a means to perform access and authenticating processing of a

stream. The LBA accessing means 33 is an I/F means inside the hard disk drive for specifying LBA (logical block address) and accessing to a disc medium. The hard disk control means 34 is a means to perform signal processing for controlling the actuator means 35 and the spindle motor means 38and carrying out record reproduction to the disc medium 36 via the head 37. The head 37 is a means for carrying out record reproduction of the signal to the disc medium 36. The spindle motor means 38 is a means to rotate a disc medium at a fixed speed. The actuator means 35 is a means for positioning the head 37 to the position made into the purpose of the disc medium 36.

[0116]The stream control means 32 of the hard disk drive shown in drawing 5 is constituted like drawing 6.

[0117]Namelythe stream control means 32The EMI detection means 39the EMI grant means 44the EMI accessing means 40the EMI judging means 41attestation and a decoding means 42the invalid data output means 45the stream access means 48the reproduction information management tool 43the data block accessing means 47the changeover switch 46It comprises the transmitting selecting means 1.

[0118]The EMI detection means 39 is a means to detect the field which described EMI from the header part in the isochronous packet data inputted from the digital I/F means 31. The EMI grant means 44 is a means to give EMI directed to the header part in the isochronous packet data outputted to the digital I/F means 31. The EMI accessing means 40 is a means which carries out record reproduction corresponding to the data block which had the EMI information which read the detected EMI information via the LBA accessing means 33and was detected further specified. The EMI judging means 41 is a means to judge whether the copyright opinion is carried out from EMI informationand its kind. Attestation and the decoding means 42 are means to decrypt the AV information which performs attestation between AV equipment via the digital I/F means 31and is inputted from the digital I/F means 31. The data block accessing means 47 is a means to notify the EMI accessing means 40 and the reproduction information management tool 43 which block number perform record or reproduction for the data of the specified block number via the LBA accessing means 33and is accessed now. In order that the stream access means 48 may execute a command according to the predetermined access method received from the digital I/F means 31the block number recorded or reproduced is specified as the data block accessing means 47The user area of the disc medium 36 shown in drawing 5 is selected like one tape from a head data block to the last data blockIt is a means to perform stream pointer management which shows in which block position a stream is now according to directions of reproductionrecorda stopetc.and to perform record or read-out for stream pointer management information to the disc medium 36 via the LBA accessing means 33. Herea predetermined access method is a method basedfor example on AV/C Digital Interface Command Set VCR subunit Specification version 2.0.1. When the changeover switch 46 outputs AV information to the digital I/F means 31 via the EMI grant means 44case

[ reproduced ]by the result of the reproduction information management tool 43It is a means to turn OFF a switchor to change to the invalid data output means 45to output invalid datasuch as blaubok and a black pictureand to output the AV information which changed the switch to attestation and the decoding means 42and was enciphered in not reproducing. The reproduction information management tool 43 is a means to record the reproduction information corresponding to the specified data blockand to read and carry out itand to judge whether it is finishing [ reproduction ] from reproduction information. The transmitting selecting means 1 is the same as that of what was explained by the 2nd embodiment or 3rd embodiment.

[0119]Nextoperation of such this embodiment is explained.

[0120]The recording operation of a hard disk drive is explained first.

[0121]STB will be considered as a device of the basis which sends AV information. This STB is provided with the transmitting selecting means 1 with the sending set of this invention. Although the controller which sends a recording start commanda record stop commandetc. exists via an IEEE1394 bus to this hard disk driveSince describing the exchange of the command of a controller and a hard disk drive swerves from the main object of this embodimentdescription is omitted in this embodiment.

[0122]Firstthis hard disk drive advances an authentication demand to STB by attestation and the decoding means 42. Thereby in the transmitting selecting means 1 by the side of STBthis hard disk drive serves as a receiving device candidate. Nextthe digital I/F means 31 will check a channel number [ want / ones ]and a hard disk drive will incorporate applicable isochronous packet dataif a recording start command is received from the digital I/F means 31. The EMI detection means 39 detects the EMI information currently held at the header part of the incorporated isochronous packet data. The EMI judging means 41 judges whether the copyright opinion is carried out from the detected EMI informationand its contents. Suppose that this hard disk drive has been recognized as a cache deviceand was chosen by the transmitting selecting means 1 by the side of STB as one specific cache device which transmits AV information still more nearly eventually. Attestation and the decoding means 42 receive the key sent from STB via the digital I/F means 31. Howeverwhen EMI is copyfreeattestation and the decoding means 42 do not receive the key from STB. In this casethe AV information itself is not enciphered. When the case where the case where EMI is copy neverand EMI are copy one generationand EMI are nomore copyattestation and the decoding means 42 receive a key.

[0123]Via the digital I/F means 31attestation and the decoding means 42 decrypt the AV informationwhen EMI of AV information is not copy free. Since AV information is not enciphered when EMI is copy freeattestation and the decoding means 42 pass AV information. The stream access means 48 directs record of the block x to the data block accessing means 47. The data block accessing means 47 notifies the block number (=x) under present access to the EMI accessing means 40. The EMI accessing means 40 matches and records the EMI information

detected by the EMI detection means 39 on the block number to which it was notified. Since the hard disk drive of this invention is functioning as a cache devicewhen EMI is copy one generation and EMI information is recorded on the disc medium 36it records without rewriting EMI to nomore copy. The data block accessing means 47 notifies the block number (=x) under present access to the reproduction information management tool 43. The reproduction information management tool 43 is matched with the block number (=x) notified at the time of recorduses reproduction information as a tableand is memorized. The information that data furthermore has not been reproduced is registered into reproduction information. That isreproduction information is initialized by play_flag=0. Nextthe reproduction information management tool 43 records reproduction information on the disc medium 36 via the LBA accessing means 33. Nextonly 1 increases a block number. That isit is considered as x=x+1. Nextit is judged whether there is any reception of another command from the digital I/F means 31. Processing will be ended if another command is received. When that is not rightprocessing after receiving a record command is repeatedly performed until there is reception of another command. It is a case where the above records AV information on the disc medium 36.

[0124]Nextthe reproduction motion of a hard disk drive is explained. The case where the partner point device which receives AV information is TV monitor is explained. Although the controller which sends a reproduction start commanda reproduction stop commandetc. exists to a hard disk drivesince it swerves from the main object of this embodiment from describing the exchange of the command of a controller and a hard disk drivedescription is omitted in this embodiment.

[0125]TV monitor advances an authentication demand to this hard disk drive first. Thereby in the transmitting selecting means 1 of this hard disk driveTV monitor serves as a candidate of a receiving device. Nextit attests to TV monitor (non-cache device) by operation of the transmitting selecting means 1 explained by a 2nd or 3rd embodimentand a key is passed. Nextif a hard disk drive receives a reproduction start commandthe stream access means 48 directs reproduction of the block x to the data block accessing means 47. The data block accessing means 47 notifies the block number (=x) under present access to the EMI accessing means 40 and the reproduction information management tool 43. The data block accessing means 47 reads AV information from the disc medium 36 via the LBA accessing means 33 simultaneously. The EMI accessing means 40 reads the EMI information corresponding to the notified block number from the disc medium 36. The read EMI information is judged by the EMI judging means 41and the decision result is sent to the transmitting selecting means 1the reproduction information management tool 43and attestation and a decoding means 42.

[0126]When EMI is copy free in an EMI decision resultthe transmitting selecting means 1 does not encipher databut AV information is outputted without being enciphered. When EMI is not copy freethe transmitting selecting means 1 enciphers and outputs data. The reproduction information management tool 43 updates reproduction information at the time of reproductionand investigates the

decision result of the read EMI information.

[0127]When EMI is not copy freethe reproduction information management tool 43 judges whether AV information has been reproduced or it is ending with reproduction. When EMI is copy never and it is ending with reproductionthe changeover switch 46 is changed to the invalid data output means 45 sideand the invalid data of a blaubok screena black pictureetc. is outputted.

[0128]Nextonly 1 increases a block number. That isit is considered as x=x+1. Nextit is judged whether there is any reception of another command from the digital I/F means 31. Processing will be ended if another command is received. If regeneration is completedthe reproduction information from the number of the initial value of the block reproduced by the reproduction information management tool 43 to the number of the last value will be accessedand reproduction information will be updated to end with reproductioni.e.play_flag=1. When that is not rightprocessing after receiving a reproduction command is repeatedly performed until there is reception of another command. It is a case where the above reproduces AV information.

[0129]When EMI of the AV information recorded on the hard disk drive is not copy freechanging the changeover switch 46 by the judgment by the reproduction information management tool 43and by managing reproduction information by the reproduction information management tool 17The AV information which is not copy free is renewable only once.

[0130]The reproduction information management tool of this embodimentan EMI accessing meansand a data block accessing means are the examples of the recording device of this inventionand the EMI accessing means of this embodimenta reproduction information management toola data block accessing meansand a changeover switch are the examples of the recording device of this invention.

[0131](A 7th embodiment) A 7th embodiment is described with reference to drawing 3 below.

[0132]This embodiment explains the case where the analog monitor is connected to STB of a 4th embodiment.

[0133]This embodiment explains focusing on a point of difference with a 4th embodiment.

[0134]In addition to the composition of a 4th embodimentit has the AV stream decoder section 24 and the D/A conversion part 25and is connected to an analog monitor from an analog terminaland STB as a sending set of this invention is constituted so that it can view and listen to the program received by STB with an analog monitor.

[0135]The AV stream decoder section 24 is a means to elongate the MPEG data outputted from the transport stream decoder part 21. The D/A conversion part 25 is a means to change the elongated digital data into an analog signal.

[0136]Nextoperation of such this embodiment is explained.

[0137]2nd and 3rd embodiments explained the broadcast wave sent from a broadcasting station choosing the apparatus of the partner point by the

transmitting selecting means 1and enabling it to use data according to copyright. Howeversince the analog monitor is connected to STBit can always view and listen to data. Thereforewhen data is outputted to the digital bus 54viewing and listening with an analog monitorthe problem that copyright cannot be kept arises.
[0138]Sowhen the transmitting selecting arrangement 1 enabled it to use data for a cache devicethe changeover switch 26 is turned OFF and it was made not to output data to an analog monitor in this embodiment. Or not using the changeover switch 26where the scramble of the data is carried outit may output to an analog monitor.
[0139]In order to do in this waythe mode or the group remembered by the mode storage means 2 or the present transmission groups memory measure 16 which constitutes the transmitting selecting means 1 is referred toWhat is necessary is just to carry out whether a changeover switch is turned OFF or data is scrambled as mentioned abovewhen it is a thing of a cache device.
[0140]By doing in this wayalso when the monitor is connected to STBcopyright can be kept.
[0141]Although this embodiment explained the sending setdata can be outputted keeping copyright by performing same processing also to the cache device to which the monitor is connected.
[0142]The digital I/F means of this embodiment may be an example of the output means of this inventionmay be an IEEE1394 interfaceand may be an interface of other standards.
[0143]In this embodimentalthough mainly explained using EMIit is possible not only this but to use CGMSand it is also possible to use EMI and CGMS together.
[0144]Not only the hard disk drive in this embodiment but devices whose record reproduction is possible in shortsuch as VCRan optical disk unitand a DVD-RAM devicecan be used for the cache device of this invention as a cache device. As a 6th embodiment explainedit is merely necessary to have the recording devicereproduction meansand transmitting selecting means of this invention in the case of Perilla frutescens (L.) Britton var. crispa (Thunb.) Decne.
[0145]In the example of composition of the cache device of this inventionas long as the function reproduced only once about the composition of those other than transmitting selecting means 1 corresponding to EMI or CGMS is realizableit may be what kind of thing. Some of the embodiments have the recording and reproducing device etc. which are indicatedfor example by Japanese Patent Application No. 10-312596and this was simply introduced for them by the Prior art.
[0146]In the sending set or cache device of this inventionif the key for enciphering / decrypting the AV information of copy nevercopy one generationand no more copy is used as a different keyit can improve safety. The authentication method for [ which passes the key of copy nevercopy one generationand no more copy ] /Obtaining may be a different authentication method. For exampleas for copy nevercopy one generation and no more copy can use a common key system using a public key system. If it does in this waysafety will improve further.
[0147]You may realize by the hardware of exclusive use [ the function of each

component of the sending set of this inventionor a cache device ]and the program of a computer may realize by software.

[0148]The program recording medium storing the program for making a computer perform the function of all or a part of each components of the sending set of this invention or a cache device also belongs to this invention.

[0149]

[Effect of the Invention]Copyright can be kept against the data by which the copyright opinion is carried out as an author's intention so that clearly from the place explained aboveIt can view and listen to data in arbitrary time zones other than the time zone when data was moreover broadcastWhen the terminal for a monitor is furthermore providedthe monitor is connected and the copyright opinion of the data is carried outthe cache devicesending setand program recording medium which can keep copyright as an author's intention can be provided.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1]The block diagram showing the composition of the transmitting selecting means in a 2nd embodiment of this invention

[Drawing 2]The block diagram showing the composition of the transmitting selecting means in a 3rd embodiment of this invention

[Drawing 3]The block diagram showing the composition of STB as a sending set in that of the 4th and operation of the 7th of this invention

[Drawing 4]The block diagram showing the composition of TV monitor as a non-cache device in a 5th embodiment of this invention

[Drawing 5]The block diagram showing the basic constitution of the hard disk drive as a cache device in a 6th embodiment of this invention

[Drawing 6]The block diagram showing the composition of the stream control means of the hard disk drive as a cache device in a 6th embodiment of this invention

[Drawing 7]The figure showing the state where the cache device and the non-cache device are connected to the digital bus in a 1st embodiment of this invention

[Drawing 8]The block diagram showing that each device is connected to the digital bus in a 1st embodiment of this invention

[Description of Notations]

1 Transmitting selecting means

2 Mode storage means

3 Receiving device candidate determination means

4 Receiving device discriminating means

5 Mode determination means

6 Reporting means

7 key generation & output means

8 Encoding means
9 Authentication means
10 Changeover switch
11 A non-cache device
12 Cache device
13 Receiving device group-ized means
14 Key generating means
15 Key distribution means
16 The present transmission groups memory measure
17 Transmission groups determination means
18 Request-to-Send detection means
19 Antenna
20 Tuner part
21 Transport stream decoder part
22 EMI grant means
23 Digital I/F means
24 AV stream decoder section
25 D/A conversion part
26 Changeover switch
27 Digital I/F means
28 EMI detection means
29 Attestation and a decoding means
30 Display

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